

What Is Claimed Is:

1. An apparatus for synchronizing frame and detecting code group/number, comprising:

an on time despreaders for despreaders a receiving input by having a slot timing
5 position designated after slot synchronization as a sampling point;

an early time and a late time despreaders for despreaders a sampling point that
is earlier or later than the sampling point of the on time despreaders;

a slew detector for detecting a time offset using energy of a despread signal
outputted from the despreaders;

10 a slew storage connected to the slew detector for storing an outputted slew
value at the result of the time offset detection based on the energy of the outputted
despread signal from the despreaders;

a multiplexer for selecting one out of outputted values from the on time, the late
time and the early time despreaders according to the output of the slew detector;

15 an energy storage for storing outputted values of the multiplexer; and

a code group detector for detecting frame synchronization and code groups
using the outputted values from the storage and from the slew storage, respectively.

2. The apparatus of claim 1, further comprising a code number detector for
20 detecting code numbers using the outputted values from the slew storage and from the
frame synchronization and code group detector, respectively.

3. The apparatus of claim 1, further comprising a synchronous code generator
for authorizing signals to each despreaders by generating synchronous codes at a
25 terminal for despreaders.

4. The apparatus of claim 1, wherein the slew detector, if $[(\text{Early time energy}) - (\text{Late time energy})]$ is greater than $(\text{On time energy})/\alpha$, controls the multiplexer to select an early time despreaded energy.

5. The apparatus of claim 1, wherein the slew detector, if $[(\text{Early time energy}) - (\text{Late time energy})]$ is smaller than $-(\text{On time energy})/\alpha$, controls the multiplexer to select a late time despreaded energy.

6. The apparatus of claim 4 or claim 5, wherein the $(\text{On time energy})/\alpha$ is a standard value for preventing degradation of the slew detector that is caused by noises mingled with a receiving signal.

7. The apparatus of claim 6, wherein ' α ' is designated to correspond to changes in the value of $(\text{Early time energy}) - (\text{Late time energy})$.

8. A method for synchronizing and detecting code group/number of an asynchronous mobile communication system having an initial cell search operation, the method comprising the steps of:

synchronizing a slot at a time of system booting;
detecting an energy and a time offset based on the designated position of a slot timing; and
detecting frame synchronization and a code group using the detected energy and information.

9. The method of claim 8, wherein the step of detecting the time offset further comprises the sub-steps of:

dispreparing for having the designated position of the slot timing as an on time sampling point through the slot synchronization;

5 early time dispreparing for having an earlier sampling point than the on time sampling point;

late time dispreparing for having a later sampling point than the on time sampling point;

controlling a multiplexer to select an energy by comparing outputted energies from each despreaders;

10 storing slew values through the time offset detection by comparing outputted energies from each despreaders; and

storing the outputted energies from the multiplexer.

15 10. The method of claim 9, wherein frame synchronization and code groups are detected by using the slew values through the time offset detection and the outputted values from the multiplexer that are stored.

20 11. The method of claim 8 or claim 19, wherein the code number detection is accomplished by using the slew values through the time offset detection and the outputted values from the multiplexer.

12. The method of claim 9, wherein the step of controlling the multiplexer to select an energy by comparing the outputted energies from each despreaders,

25 (a) if $[(\text{Early time energy}) - (\text{Late time energy})]$ is greater than (On time

energy)/ α , the slew detector controls the multiplexer to select an early time despreaded energy, thereby storing the early time despreaded energy in an energy storage;

(b) if $[(\text{Early time energy}) - (\text{Late time energy})]$ is smaller than $-(\text{On time energy})/\alpha$, the slew detector controls the multiplexer to select a late time despreaded

energy, thereby storing the late time despreaded energy in an energy storage; and

(c) if $[(\text{Early time energy}) - (\text{Late time energy})]$ satisfies neither case (a) nor (b), the slew detector controls the multiplexer to select an on time despreaded energy, thereby storing the on time despreaded energy in an energy storage.

13. The method of claim 9, wherein the step of storing the slew values through the time offset detection by comparing the outputted energies from each despreaded, if $[(\text{Early time energy}) - (\text{Late time energy})]$ is greater than $(\text{On time energy})/\alpha$, meaning that a present standard time is slower than a receiving signal's timing, the present standard timing is retarded (-) to be the receiving signal's timing, making the present standard timing be the early despreaded energy and storing the retarded value as a slew value.

14. The method of claim 9, wherein the step of storing the slew values through the time offset detection by comparing the outputted energies from each despreaded, if $[(\text{Early time energy}) - (\text{Late time energy})]$ is smaller than $-(\text{On time energy})/\alpha$, meaning that a present standard time is faster than a receiving signal's timing, the present standard timing is advanced (+) to be the receiving signal's timing, making the present standard timing be the late despreaded energy and storing the advanced value as a slew value.

15. The method of claim 10, or 13, or 14, wherein the step of detecting frame synchronization and code groups by using the slew values through the time offset and the outputted values from the multiplex that are saved, the slew values are information to manifest which despreaders generate the energy used for the frame synchronization and code group detection.

16. The method of claim 11 or 15, wherein the step of detecting code numbers by using the slew values through the time offset and the outputted values from the frame synchronization and code group detector, the slew values are +, - timing information that is derived by summing the slew values of each case.

17. The method of claim 16, wherein the code detector detects code numbers by using the +, - timing information derived by summing the slew values corresponding to the energy used for the frame synchronization and code group detector, being stored in the slew value storage.